

# OTITIS MEDIA AND INTERNA

## (INFLAMMATION OF THE MIDDLE EAR AND INNER EAR)

### BASICS

#### OVERVIEW

- Inflammation of the middle ear (known as “otitis media”) and inner ear (known as “otitis interna”), most commonly caused by bacterial infection

#### SIGNALMENT/DESCRIPTION of ANIMAL

##### Species

- Dogs and cats

##### Breed Predispositions

- Cocker spaniels and other long-eared breeds
- Poodles with long-term (chronic) inflammation of the ears (known as “otitis”) or the throat (known as “pharyngitis”) associated with dental disease

#### SIGNS/OBSERVED CHANGES in the ANIMAL

- Depend on severity and extent of the infection; range from no signs to those related to middle ear discomfort and nervous system involvement
- Pain when opening the mouth; reluctance to chew; shaking the head; pawing at the affected ear
- Head tilt
- Pet may lean, veer, or roll toward the side or direction of the affected ear
- Animal’s sense of balance may be altered (known as “vestibular deficits”)—persistent, transient or episodic
- Involvement of both ears—wide movements of the head, swinging back and forth; wobbly or incoordinated movement of the body (known as “truncal ataxia”), and deafness
- Vomiting and nausea—may occur during the sudden (acute) phase
- Facial nerve damage—the “facial nerve” goes to the muscles of the face, where it controls movement and expression, as well as to the tongue, where it is involved in the sensation of taste; signs of facial nerve damage include saliva and food dropping from the corner of the mouth; inability to blink; discharge from the eye; weakness (known as “paresis”) or paralysis of the affected ear and the eyelids, lips, and nostrils on the side of the affected ear; may have reduced tear production; with long-term (chronic) facial nerve paralysis, the face may contract or twist toward the affected side, caused by development of scar tissue in the muscles
- Unequal size of the pupils (known as “anisocoria”), the pupil is smaller on the side of the affected ear, protrusion of the third eyelid, the eyeball is withdrawn into the socket (known as “enophthalmos”) and the upper eyelid droops (known as “ptosis”)—these signs are known as “Horner’s syndrome”
- Evidence of redness of the ear, discharge, and thick and narrowed external ear canals indicates inflammation of the outer ear (known as “otitis externa”)
- Gray, dull, opaque, and bulging eardrum (known as the “tympanic membrane”), observed during examination using an otoscope to look down into the ear canal—indicates some type of fluid build-up in the middle ear
- Dental tartar, inflammation of the gums (known as “gingivitis”), of the tonsils (known as “tonsillitis”), or the throat (pharyngitis)—may be present and associated with inflammation of the middle ear (otitis media) and inner ear (otitis interna)
- Enlargement of the mandibular lymph node on the side of the ear inflammation (known as “mandibular lymphadenopathy”)—may occur with severe infections
- Superficial loss of tissue on the surface of the cornea, the clear outer layer of the front of the eye (known as a “corneal ulcer”)—may be caused by inability to blink or a dry eye
- Signs associated with damage to nervous system structures depend on the severity and location
- Pet may be reluctant to move and may stay in a crouched posture with wide movements of the head, swinging back and forth
- Short, rapid movements of the eyeball (known as “nystagmus”)

#### CAUSES

- Bacteria—primary disease-causing agents
- Yeast (*Malassezia*, *Candida*) and fungus (*Aspergillus*)—possible disease-causing agents
- Mites—increase likelihood of secondary bacterial infections
- Disease involving only one ear—foreign bodies, trauma, polyps, and tumors (such as fibromas, squamous cell carcinoma, ceruminous gland carcinoma, and primary bone tumors)

#### RISK FACTORS

- Inflammatory masses that develop from the middle ear or eustachian tube (known as “nasopharyngeal polyps”) and tumors or cancer of the inner, middle, or outer ear—may increase susceptibility to bacterial infection
- Vigorous ear flush

- Ear-cleaning solutions (such as chlorhexidine)—may be irritating to the middle and inner ear; avoid if the ear drum (tympanic membrane) is ruptured
- Inhalant anesthesia and traveling by airplane—change middle-ear pressures

## TREATMENT

### HEALTH CARE

- Inpatient—severe debilitating infection; nervous system signs
- Fluid therapy—if pet is unable to eat or drink, owing to nausea or vomiting and/or disorientation
- Coexistent inflammation of the outer ear (otitis externa)—bacterial culture and sensitivity testing; clean the ear; use warm normal saline if the ear drum (tympanic membrane) is ruptured; if a cleaning solution is used, follow with a thorough flush with normal saline; carefully dry the ear canal (drying products [known as “astringents”], such as Otic Domeboro® solution or boric acid, can be effective)

### ACTIVITY

- Restrict activity in pets with substantial alteration of sense of balance (vestibular disorder) to avoid injury

### DIET

- Vomiting from alteration of sense of balance (vestibular disorder)—withhold food and water for 12 to 24 hours
- Severe disorientation—hand feed and water small amounts frequently; elevate head to avoid aspiration pneumonia

### SURGERY

- Reserve surgery for patients that have relapsing inflammation of the middle and inner ear (otitis media/interna), that are not responding to medical treatment or that are deteriorating
- Do not rely on severity of nervous system signs as an indication for surgical intervention; reserve surgery for patients with evidence of fluid build-up in the middle ear; infection/inflammation of the bone (known as “osteomyelitis”) surrounding the ear that is not responsive to medical management; and presence of inflammatory masses that develop from the middle ear or eustachian tube (nasopharyngeal polyps) or tumors/cancer
- Surgery may be indicated in some cases of inflammation of the middle ear (otitis media) to drain the middle ear cavity (procedure known as “bulla osteotomy”)
- Surgical removal of part of the outer ear (known as “ear ablation”) through the horizontal ear canal—indicated when inflammation of the middle ear (otitis media) is associated with recurrent inflammation of the outer ear (otitis externa) or tumors/cancer
- Obtains samples at time of surgery for microscopic examination of abnormal tissue and for bacterial culture and sensitivity of fluid in the middle ear

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Topical (applied directly into the ear) antibiotic solutions—chloramphenicol or a triple antibiotic preparation; or ofloxacin otic solution (Floxin® Otic)—dogs and cats
- Antibiotics—broad-spectrum antibiotics administered by mouth or injection; long-term treatment (6 to 8 weeks, if presumptive diagnosis); select antibiotics on basis of bacterial culture and sensitivity testing, if available
- Amoxicillin/clavulanic acid (Clavamox®)—good first choice antibiotic
- Fluoroquinolone or third generation cephalosporin antibiotics are good second choice alternatives or can be used in combination, if bacterial culture and sensitivity test results are unavailable; examples include [enrofloxacin](#) (Baytril®), [marbofloxacin](#) (Zeniquin®), or [cefpodoxime](#) (Simplicef®)
- [Clindamycin](#) (Cleocin®) may be administered, if anaerobes are suspected; “anaerobes” are bacteria that can live and grow in the absence of oxygen

## FOLLOW-UP CARE

### PATIENT MONITORING

- Evaluate after 10 to 14 days, or sooner if the patient’s condition is deteriorating

### PREVENTIONS AND AVOIDANCE

- Routine ear cleaning—may reduce chances of infection of the middle ear and inner ear
- Routine professional teeth cleaning, with the animal under anesthesia (known as a “dental prophylaxis”)—may reduce chances of infection of the middle and inner ear

### POSSIBLE COMPLICATIONS

- Altered sense of balance (vestibular disorder), facial nerve damage or Horner’s syndrome (condition in which one pupil is small or constricted, the eyelid droops, and the eyeball is withdrawn into the socket); the “facial nerve” goes to the muscles of the face and controls movement and expression, as well as to the tongue, where it is involved in the sensation of taste; signs of facial nerve damage include weakness (known as “paresis”) or paralysis of the affected ear and the eyelids, lips, and nostrils on the side of the affected ear
- Severe middle/inner ear infections—infection may spread to the brain stem
- Infection/inflammation (osteomyelitis) of the bone of the skull around the ear and fluid build-up in the middle ear cavity—common sequela to severe, long-term (chronic) inflammation of the outer ear (otitis externa)
- Surgery to drain the middle ear (procedure is a bulla osteotomy)—postoperative complications include Horner’s syndrome (condition in which one pupil is small or constricted, the eyelid droops, and the eyeball is withdrawn into the socket), facial paralysis, and onset or worsening of an altered sense of balance (vestibular disorder), or deafness with infections involving both ears

#### **EXPECTED COURSE AND PROGNOSIS**

- Inflammation of the middle ear (otitis media) and inner ear (otitis interna)—usually responsive to medical management; 2- to 4-month course of antibiotics should be considered to avoid relapse
- Signs associated with an altered sense of balance (vestibular disorder)—improvement in 2 to 6 weeks; more rapid in small dogs and in cats

#### **KEY POINTS**

- Most bacterial infections of the middle ear and inner ear resolve with an early, aggressive course of long-term, broad-spectrum antibiotics
- Relapsing signs may occur
- Surgical drainage of the middle ear may be necessary

